Embedded Computing for
Business-Critical Continuity™

COMX-CAR-610 COM Express Carrier Board

Installation and Use

P/N: 6806800K26D

August 2011

EMERSON
Network Power

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About this Manual

Overview of Contents

This manual is divided into the following chapters and appendices:

- *Introduction* provides an overview of the product's features.
- *Hardware Preparation and Installation* provides instructions on installing and removing the module.
- *Controls, LEDs, and Connectors* provides information on the pin assignments of the various connectors on the board.
- *Functional Description* discusses the functions of various components on the board.
- *BIOS* discusses the functions that are available on the Setup Utility.
- *Related Documentation* lists various documentation relevant to the product.
- *Safety Notes* provides a summary of the safety notices applicable to the product.
- *Sicherheitshinweise* is a German version of the *Safety Notes*.

Abbreviations

This document uses the following abbreviations:

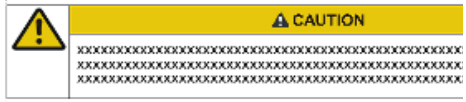
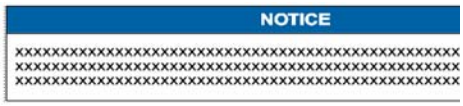
Abbreviation	Definition
ACPI	Advanced Configuration Power Interface
AMC	Alarm Management Controller
ARP	Address Resolution Protocol
BDS	Boot Device Selection
DDR	Double Data Rate
DXE	Driver Execution Environment
EEPROM	Electrically Erasable Programable Read-Only Memory
eUSB	Embedded Universal Serial Bus
GbE	Gigabit Ethernet
GPIO	General Purpose Input Output
HDMI	High-Definition Multimedia Interface

Abbreviation	Definition
I^2C	Inter-Integrated Circuit
I/O	Input/Output
IDE	Integrated Device Electronics
LED	Light Emitting Diode
LIN	Line In
LFM	Linear Feet per Minute
LPT	Line Print Terminal
LOUT	Line Out
LDVS	Low Voltage Differential Signaling
MICIN	Microphone In
NVRAM	Non-volatile RAM
OEM	Original Equipment Manufacturer
PCI	Peripheral Component Interconnect
PCI-E	Peripheral Component Interconnect Express
POST	Power-on Self Test
RTC	Real Time Clock
SATA	Serial AT Attachment
SCSI	Small Computer System Interface
SPD	Serial Presence Detect
SPI	Serial Peripheral Interface
SODIMM	Small Outline Dual In-line Memory Module
Super I/O	Super Input/Output
TPM	Trusted Platform Module
USB	Universal Serial Bus
VGA	Video Graphics Adapter
WDT	Watchdog Timer

Conventions

The following table describes the conventions used throughout this manual.

Notation	Description
0x00000000	Typical notation for hexadecimal numbers (digits are 0 through F), for example used for addresses and offsets
0b0000	Same for binary numbers (digits are 0 and 1)
bold	Used to emphasize a word
`Screen`	Used for on-screen output and code related elements or commands in body text
`Courier + Bold`	Used to characterize user input and to separate it from system output
Reference	Used for references and for table and figure descriptions
File > Exit	Notation for selecting a submenu
<text>	Notation for variables and keys
[text]	Notation for software buttons to click on the screen and parameter description
...	Repeated item for example node 1, node 2, ..., node 12
. . .	Omission of information from example/command that is not necessary at the time being
..	Ranges, for example: 0..4 means one of the integers 0,1,2,3, and 4 (used in registers)
|	Logical OR

Notation	Description
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
	Indicates a property damage message
	No danger encountered. Pay attention to important information

Summary of Changes

This manual has been revised and replaces all prior editions.6806800K26B

Part Number	Publication Date	Description
6806800A36C	January 2006	First edition
6806800K26B	March 2010	GA Version
6806800K26C	November 2010	GA version: Updated Section 3.4.4 PCI Express
6806800K26D	September 2011	Updated Table "P12 and P14, Jumper Settings for SPI Flash SF100 header" on page 47, Table "P15 and P38, Jumper Configuration to Enable/Disable BIOS" on page 47. Added Table "P17 Case Open Select Header" on page 48 and Table "P40 PS_ON Select Jumper" on page 44.

1.1 Features

The COMX-CAR-610 COM Express Carrier Board is a Type 6 carrier board. This board is designed to support the COM Express Type 6 Specification and is compatible with COM Express Type 1 Specification. This board supports the following COM Express form factors: compact, basic, and extended.

Table 1-1 Carrier Board Features

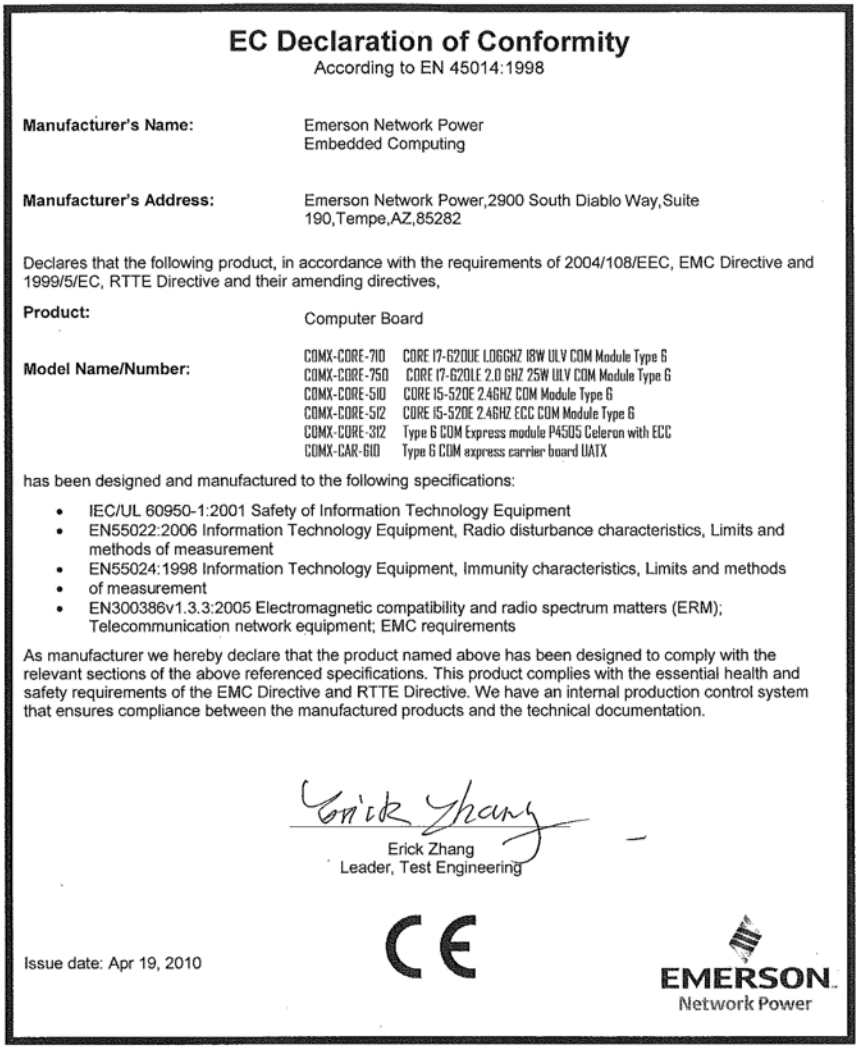
Feature	Description
Form factor	MicroATX (9.6" x 9.6")
Video	• One backlight header for powering a backlight • One LVDS connector • Two Display Port connectors • One VGA and HDMI connector
Audio	• One audio jack: MICIN,LOUT,LIN • One audio header: MICIN, LOUT
Clock buffer	• 33 MHz clock buffer: ICS9112AM-16 • 100 MHz clock buffer: ICS9DB108BFLF
LPT	One LPT header from Super I/O
KBMS	One keyboard and mouse header
COM	• Four RS-232 ports (COM1–COM4) • Two RS-232/RS-422/RS-485 ports (COM5 and COM6)
LAN	• LAN1–GbE from COM Express module • LAN2–GbE from carrier board (WG82574L)
USB	• Four USB3.0 ports • Three USB 2.0 ports (in header) • One eUSB flash (maximum of 8 GB)
PCI-E Slots	• One PCI-E x16 slot • Two PCI-E x4 slots • One PCI-E x1 slot
PCI-E Minicard	One PCI-E Mini-Card for WiFi or WiMax
Serial ATA	Four SATA II ports

Table 1-1 Carrier Board Features (continued)

Feature	Description
Trusted Platform Module	One onboard TPM header
Power supply	• One 24-pin ATX power header • One 4-pin ATX_12V header • One battery socket
Hardware Monitor and Controller	• Three-channel voltage sensors: 5 V, 3.3 V and 12 V • Two-channel temperature sensors: module and system • Two-channel Fan speed Control: Module and system
Supported COM Express Form Factors	• Compact • Basic • Extended
Wake-Up Events	• Power Button: S0, S3, S4, S5 • KB: S0, S3 • Mouse: S0, S3 • PME: S0, S3, S4, S5 • USB: S0, S3 • Wake on LAN support

1.2 Standard Compliances

Figure 1-1 Standard Compliances



EC Declaration of Conformity

According to EN 45014:1998

Manufacturer's Name: Emerson Network Power
Embedded Computing

Manufacturer's Address: Emerson Network Power,2900 South Diablo Way,Suite 190,Tempe,AZ,85282

Declares that the following product, in accordance with the requirements of 2004/108/EEC, EMC Directive and 1999/5/EC, RTTE Directive and their amending directives,

Product: Computer Board

Model Name/Number:

COMX-CORE-710	CORE I7-620UE 1.06GHZ 18W ULV COM Module Type 6
COMX-CORE-750	CORE I7-620LE 2.0 GHZ 25W ULV COM Module Type 6
COMX-CORE-510	CORE I5-520E 2.4GHZ COM Module Type 6
COMX-CORE-512	CORE I5-520E 2.4GHZ ECC COM Module Type 6
COMX-CORE-312	Type 6 COM Express module P4505 Celeron with ECC
COMX-CAR-610	Type 6 COM express carrier board UATX

has been designed and manufactured to the following specifications:

- IEC/UL 60950-1:2001 Safety of Information Technology Equipment
- EN55022:2006 Information Technology Equipment, Radio disturbance characteristics, Limits and methods of measurement
- EN55024:1998 Information Technology Equipment, Immunity characteristics, Limits and methods
- of measurement
- EN300386v1.3.3:2005 Electromagnetic compatibility and radio spectrum matters (ERM); Telecommunication network equipment; EMC requirements

As manufacturer we hereby declare that the product named above has been designed to comply with the relevant sections of the above referenced specifications. This product complies with the essential health and safety requirements of the EMC Directive and RTTE Directive. We have an internal production control system that ensures compliance between the manufactured products and the technical documentation.

Erick Zhang
Leader, Test Engineering

Issue date: Apr 19, 2010

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1.3 Mechanical Data

Figure 1-2 COMX-CORE Series Mechanical Dimensions (Top View)

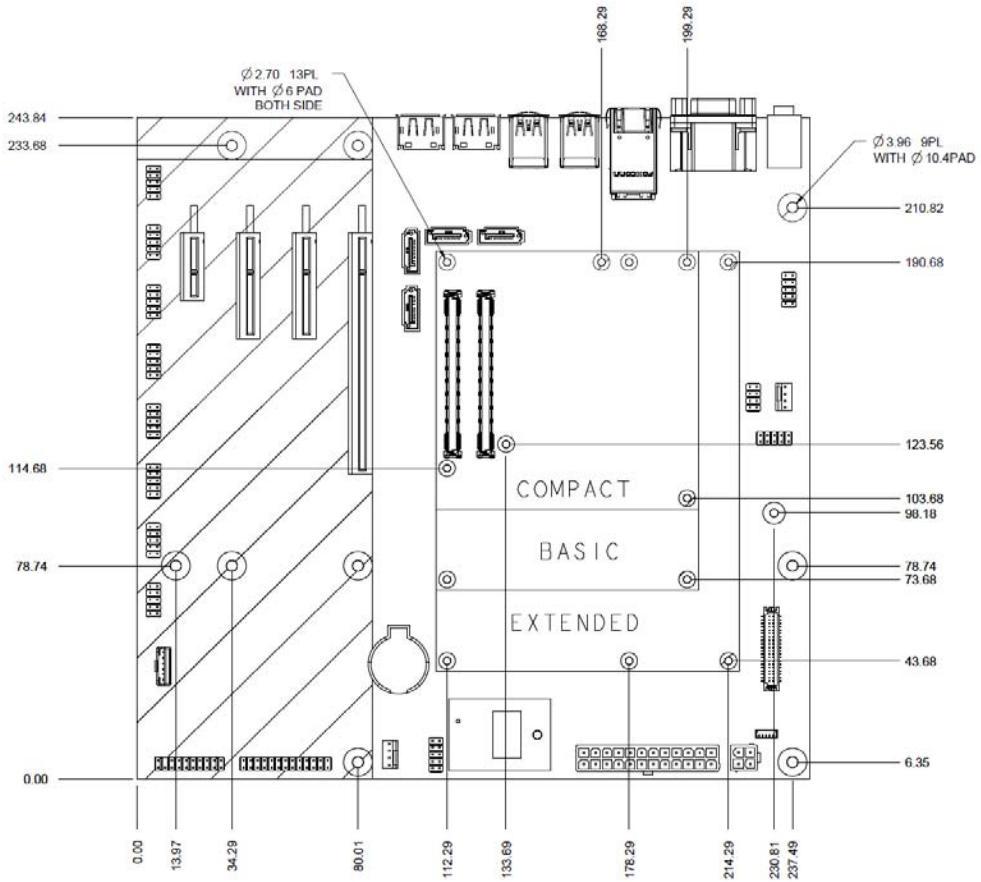
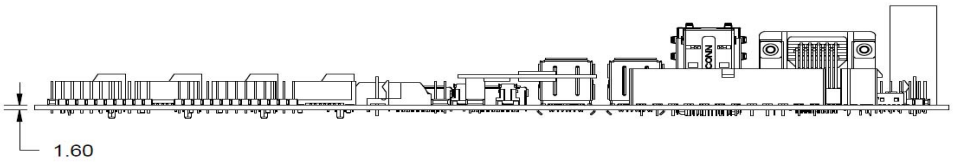


Figure 1-3 COMX-CORE Series Mechanical Dimensions (SideView)



1.4 Ordering Information

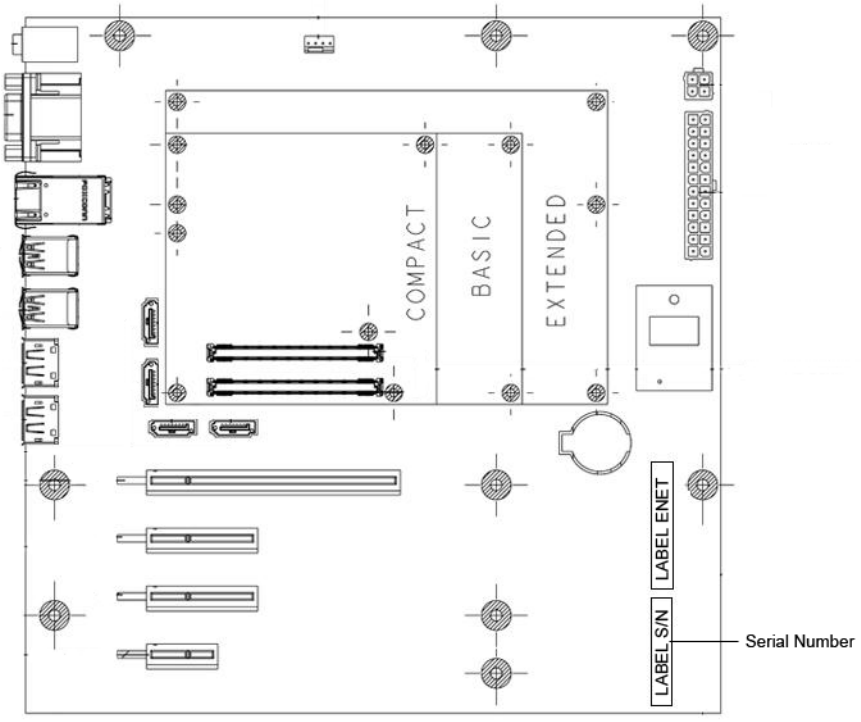
Table 1-2 Ordering Information

Orderable Number	Description
COMX-CAR-610	Type 6 COM express carrier board UATX

1.5 Product Identification

The following figure shows the location of the board's serial number.

Figure 1-4 Location of Product Serial Number



2.1 Environmental and Power Requirements

You must make sure that the board, when operated in your particular system configuration, meets the environmental requirements specified below.

Operating temperatures refer to the temperature of the air circulating around the board and not to the component temperature.

NOTICE

Product Damage

- **High humidity and condensation on surfaces cause short circuits.**
- **Do not operate the system outside the specified environmental limits. Make sure the product is completely dry and there is no moisture on any surface before applying power.**

2.1.1 Environmental Requirements

Table 2-1 Environmental Requirements

Environmental Factor	Operating	Non-Operating
Temperature	0 to +55°C	-40 to +85°C
Shock	20 g 11 ms sine or saw	
Vibration	0.01g ^2/Hz at 5-500 Hz Random Vibration	
Air Flow	400 LFM at 0 to 55°C	
Humidity	10-90% (non-condensing)	

2.1.2 Power Requirements

The following table shows the power consumption of the carrier board without a COM Express module installed.

Table 2-2 Carrier Board Power Consumption

Item	+5.0V POWER	+3.3V POWER	+12V POWER	5V SB POWER	TOTAL POWER
Power	50W	6W	160W	10W	240W Max

Note: Including 120W power dissipation for COM-E module.

The following table lists the onboard voltages that the DC input generates. The table also provides an estimate of the typical and maximum current required from the power supply.

Table 2-3 Current Requirements from the Power Supply

Supply Voltage	Source	Voltage	Maximum Current
VCC12	ATX power	12 V	13 A
VCC5	ATX power	5 V	10 A
VCC3	ATX power	3 V	2 A
VCC1_5	VCC3	1.5 V	0.5 A
5VSB	ATX power	5 V	2 A
5VDual	VCC1_5 and 5VSB	5 V	10 A
3VDual	VCC3 and 5VSB	3 V	1 A
VCC1_8	VCC3	1.8 V	0.5 A

2.2 Unpacking and Inspecting the Board

NOTICE

Damage of Circuits

- **Electrostatic discharge and incorrect installation and removal of the product can damage circuits or shorten its life.**
- **Before touching the product make sure that you are working in an ESD-safe environment or wearing an ESD wrist strap or ESD shoes. Hold the product by its edges and do not touch any components or circuits.**

1. Verify that you have received all items of your shipment:
   - Printed *Quick Start Guide* and *Safety Notes*
   - COMX-CAR-610 COM Express Carrier Board
   - Accessories:
     - Cable, URAT, 2X5PIN housing to DB9PIN connector, with I/O panel, 300MM length
     - Cable, USB, 2X5PIN housing to USB X 2 connector, with I/O panel, 300MM length
     - Cable, LPT, 2X13PIN housing to DB25 PIN connector, with I/O panel, 300MM length
     - Cable, PS/2, MINI DIN6P to PS/2 connector, 300MM length
     - COMX-CAR-610 Carrier Board I/O Shield

2. Check for damage and report any damage or differences to customer service.
3. Remove the desiccant bag shipped together with the product.

NOTICE

Environmental Damage

- **Improper disposal of used products may harm the environment.**
- **Always dispose of used products according to your country's legislation and manufacturer's instructions.**

2.3 Installation and Removal of the COM Express Module

The assembled COM Express module with the attached heat spreader is attached to a carrier board.

Installing the COM Express Module on the Carrier Board

1. Line up the board-to-board connector of the COM Express module with the board-to-board connector of the COMX-CAR-610.
2. Make sure that the interconnectors are properly aligned and that the seven standoffs have contact with the top of the COMX-CAR-610.
3. Turn over the COM Express module and the COMX-CAR-610.
4. From the backside of the COMX-CAR-610, locate the screw holes.
5. Use the screws to fasten the COM Express module assembly to the COMX-CAR-610.

Removing the COM Express Module from the Carrier Board

1. Turn over the COM Express module and the COMX-CAR-610.
2. On the back of the COMX-CAR-610, locate the seven screws that connect the COM Express module to the COMX-CAR-610.
3. Loosen and remove the screws.
4. While holding the edges, pull the COM Express module from the COMX-CAR-610.

2.4 Replacing the Onboard Battery

NOTICE

Product Damage

- Incorrect replacement of lithium batteries can result in a hazardous explosion.
- When exchanging the on-board lithium battery, make sure that the new and the old battery are exactly the same battery models.
- If the respective battery model is not available, contact your local Emerson sales representative for the availability of alternative officially approved battery models.

PCB and Battery Holder Damage

- Removing the battery with a screw driver may damage the PCB or the battery holder.
- Do not use a screw driver to remove the battery from its holder.

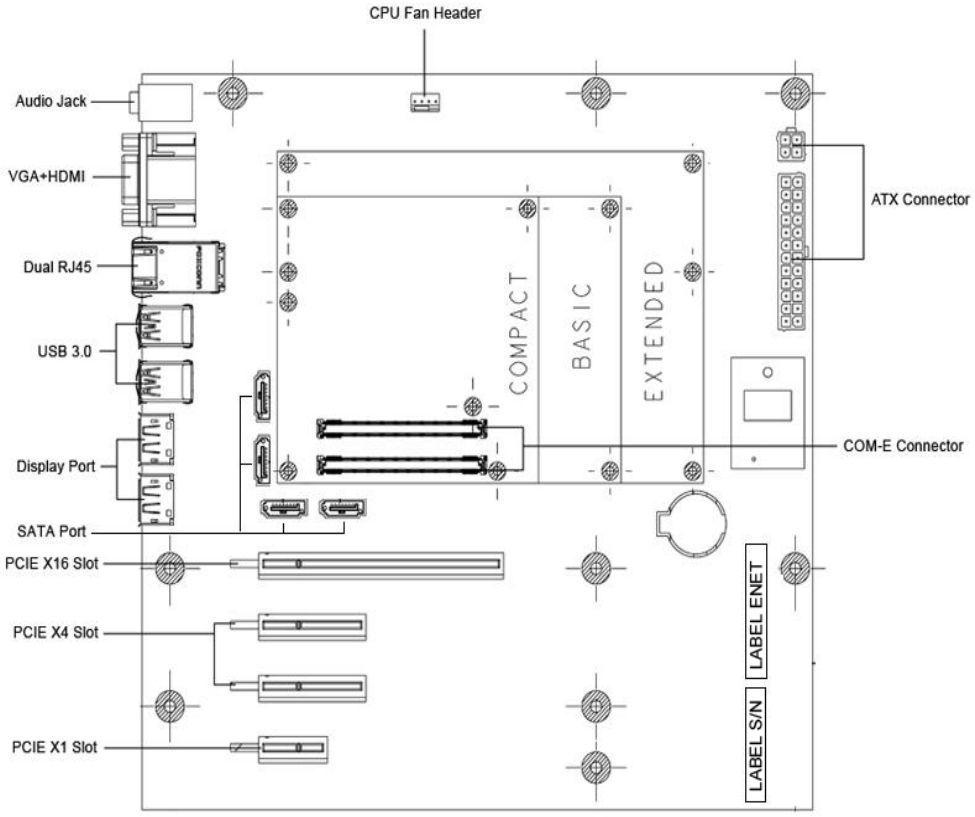
Data Loss

- Installing another battery type than the one that is mounted at product delivery may cause data loss since other battery types may be specified for other environments or may have a shorter lifetime.
- Only use the same type of lithium battery as is already installed.

1. Remove the old battery.
2. Install the new battery with the plus sign (+) facing up.
3. Dispose of the old battery according to your country's legislation and in an environmentally safe way.

3.1 Carrier Board Layout

Figure 3-1 COMX-CAR-610 COM Express Carrier Board Component Layout



3.2 COM Express Board-to-Board Connector

This section details the pin assignments on the COM Express connector based on the Type 6 Specification.

Table 3-1 COM Express Connector Pin Definition

Row	A	B	C	D
1	GND(FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
2	GBE0_MDI3-	GBE0_ACT#	GND	GND
3	GBE0_MDI3+	LPC_FRAME#	USB0_SSRX-	USB0_SSTX-
4	GBE0_LINK100#	LPC_AD0	USB0_SSRX+	USB0_SSTX+
5	GBE0_LINK1000#	LPC_AD1	GND	GND
6	GBE0_MDI2-	LPC_AD2	USB1_SSRX-	USB1_SSTX-
7	GBE0_MDI2+	LPC_AD3	USB1_SSRX+	USB1_SSTX+
8	GBE0_LINK#	LPC_DRQ0#	GND	GND
9	GBE0_MDI1-	LPC_DRQ1#	USB2_SSRX-	USB2_SSTX-
10	GBE0_MDI1+	LPC_CLK	USB2_SSRX+	USB2_SSTX+
11	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
12	GBE0_MDI0-	PWRBTN#	USB3_SSSRX-	USB3_SSTX-
13	GBE0_MDI0+	SMB_CK	USB3_SSRX+	USB3_SSTX+
14	GBE0_CTREF	SMB_DAT	GND	GND
15	SUS_S3#	SMB_ALERT#	DDI1_PAIR6+	DDI1_AUX+
16	SATA0_TX+	SATA1_TX+	DDI1_PAIR6-	DDI1_AUX-
17	SATA0_TX-	SATA1_TX-	RSVD	RSVD
18	SUS_S4#	SUS_STAT#	RSVD	RSVD
19	SATA0_RX+	SATA1_RX+	PCIE_RX6+	PCIE_TX6+
20	SATA0_RX-	SATA1_RX-	PCIE_RX6-	PCIE_TX6-
21	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
22	SATA2_TX+	SATA3_TX+	PCIE_RX7+	PCIE_TX7+
23	SATA2_TX-	SATA3_TX-	PCIE_RX7-	PCIE_TX7-

Table 3-1 COM Express Connector Pin Definition (continued)

Row	A	B	C	D
24	SUS_S5#	PWR_OK	DDI1_HPD	RSVD
25	SATA2_RX+	SATA3_RX+	DDI1_PAIR4+	RSVD
26	SATA2_RX-	SATA3_RX-	DDI1_PAIR4-	DDI1_PAIR0+
27	BATLOW#	WDT	RSVD	DDI1_PAIR0-
28	ATA_ACT#	AC/HDA_SDIN2	RSVD	RSVD
29	AC/HDA_SYNC	AC/HDA_SDIN1	DDI1_PAIR5+	DDI1_PAIR1+
30	AC/HDA_RST#	AC/HDA_SDIN0	DDI1_PAIR5-	DDI1_PAIR1-
31	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
32	AC/HDA_BITCLK	SPKR	DDI2_AUX+	DDI1_PAIR2+
33	AC/HDA_SDOUT	I2C_CK	DDI2_AUX-	DDI1_PAIR2-
34	BIOS_DISABLE#	I2C_DAT	DDI2_CTRLCLK	DDI2_CTRLDATA
35	THRMTRIP#	THRM#	RSVD	RSVD
36	USB6-	USB7-	DDI3_AUX+	DDI1_PAIR3+
37	USB6+	USB7+	DDI3_AUX-	DDI1_PAIR3-
38	USB_6_7_OC#	USB_4_5_OC#	DDI3_CTRLCLK	DDI3_CTRLDATA
39	USB4-	USB5-	DDI3_PAIR0+	DDI2_PAIR0+
40	USB4+	USB5+	DDI3_PAIR0-	DDI2_PAIR0-
41	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
42	USB2-	USB3-	DDI3_PAIR0+	DDI2_PAIR1+
43	USB2+	USB3+	DDI3_PAIR0-	DDI2_PAIR1-
44	USB_2_3_OC#	USB_0_1_OC#	DDI3_HPD	DDI2_HPD
45	USB0-	USB1-	RSVD	RSVD
46	USB0+	USB1+	DDI3_PAIR2+	DDI2_PAIR2+
47	VCC_RTC	EXCD1_PERST#	DDI3_PAIR2-	DDI2_PAIR2-
48	EXCD0_PERST#	EXCD1_CPPE#	RSVD	RSVD
49	EXCD0_CPPE#	SYS_RESET#	DDI3_PAIR3+	DDI2_PAIR3+
50	LPC_SERIRQ	CB_RESET#	DDI3_PAIR3-	DDI2_PAIR3-

Table 3-1 COM Express Connector Pin Definition (continued)

Row	A	B	C	D
51	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
52	PCIE_TX5+	PCIE_RX5+	PEG_RX0+	PEG_TX0+
53	PCIE_TX5-	PCIE_RX5-	PEG_RX0-	PEG_TX00-
54	GPI0	GPO1	TYPE0#	PEG_LANE_RV#
55	PCIE_TX4+	PCIE_RX4+	PEG_RX1+	PEG_TX1+
56	PCIE_TX4-	PCIE_RX4-	PEG_RX1-	PEG_TX1-
57	GND	GPO2	TYPE1#	TYPE2#
58	PCIE_TX3+	PCIE_RX3+	PEG_RX2+	PEG_TX2+
59	PCIE_TX3-	PCIE_RX3-	PEG_RX2-	PEG_TX2-
60	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
61	PCIE_TX2+	PCIE_RX2+	PEG_RX3+	PEG_TX3+
62	PCIE_TX2-	PCIE_RX2-	PEG_RX3-	PEG_TX3-
63	GPI1	GPO3	RSVD	RSVD
64	PCIE_TX1+	PCIE_RX1+	RSVD	RSVD
65	PCIE_TX1-	PCIE_RX1-	PEG_RX4+	PEG_TX4+
66	GND	WAKE0#	PEG_RX4-	PEG_TX4-
67	GPI2	WAKE1#	RSVD	GND
68	PCIE_TX0+	PCIE_RX0+	PEG_RX5+	PEG_TX5+
69	PCIE_TX0-	PCIE_RX0-	PEG_RX5-	PEG_TX5-
70	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
71	LVDS_A0+	LVDS_B0+	PEG_RX6+	PEG_TX6+
72	LVDS_A0-	LVDS_B0-	PEG_RX6-	PEG_TX6-
73	LVDS_A1+	LVDS_B1+	DDI1_CTRLDATA	DDI1_CTRLCLK
74	LVDS_A1-	LVDS_B1-	PEG_RX7+	PEG_TX7+
75	LVDS_A2+	LVDS_B2+	PEG_RX7-	PEG_TX7-
76	LVDS_A2-	LVDS_B2-	GND	GND
77	LVDS_VDD_EN	LVDS_B3+	RSVD	IDE_CBLID#

Table 3-1 COM Express Connector Pin Definition (continued)

Row	A	B	C	D
78	LVDS_A3+	LVDS_B3-	PEG_RX8+	PEG_TX8+
79	LVDS_A3-	LVDS_BKLT_EN	PEG_RX8-	PEG_TX8-
80	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
81	LVDS_A_CK+	LVDS_B_CK+	PEG_RX9+	PEG_TX9+
82	LVDS_A_CK-	LVDS_B_CK-	PEG_RX9-	PEG_TX9-
83	LVDS_I2C_CK	LVDS_BKLT_CTRL	RSVD	RSVD
84	LVDS_I2C_DAT	VCC_5V_SBY	GND	GND
85	GPI3	VCC_5V_SBY	PEG_RX10+	PEG_TX10+
86	KBD_RST#	VCC_5V_SBY	PEG_RX10-	PEG_TX10-
87	KBD_A20GATE	VCC_5V_SBY	GND	GND
88	PCIE0_CK_REF+	RSVD	PEG_RX11+	PEG_TX11+
89	PCIE0_CK_REF-	VGA_RED	PEG_RX11-	PEG_TX11-
90	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
91	SPI_CS0#	VGA_GRN	PEG_RX12+	PEG_TX12+
92	SPI_MISO	VGA_BLU	PEG_RX12-	PEG_TX12-
93	GPO0	VGA_HSYNC	GND	GND
94	SPI_CLK	VGA_VSYNC	PEG_RX13+	PEG_TX13+
95	SPI_MOSI	VGA_I2C_CK	PEG_RX13-	PEG_TX13-
96	GND	VGA_I2C_DAT	GND	GND
97	VCC_12V	RSVD	RSVD	PEG_ENABLE#
98	VCC_12V	RSVD	PEG_RX14+	PEG_TX14+
99	VCC_12V	RSVD	PEG_RX14-	PEG_TX14-
100	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)
101	VCC_12V	VCC_12V	PEG_RX15+	PEG_TX15+
102	VCC_12V	VCC_12V	PEG_RX15-	PEG_TX15-
103	VCC_12V	VCC_12V	GND	GND
104	VCC_12V	VCC_12V	VCC_12V	VCC_12V

Table 3-1 COM Express Connector Pin Definition (continued)

Row	A	B	C	D
105	VCC_12V	VCC_12V	VCC_12V	VCC_12V
106	VCC_12V	VCC_12V	VCC_12V	VCC_12V
107	VCC_12V	VCC_12V	VCC_12V	VCC_12V
108	VCC_12V	VCC_12V	VCC_12V	VCC_12V
109	VCC_12V	VCC_12V	VCC_12V	VCC_12V
110	GND(FIXED)	GND(FIXED)	GND(FIXED)	GND(FIXED)

3.3 LEDs

Table 3-2 LEDs

States	Location	Description
S0	D20	ON: System is full on
S3	D22	ON: System is suspended to memory
S4	D24	ON: System is hybernating
S5	D23	ON: System is off
System PWROK	D21	ON: All system power is OK
Type6 Error	D34	ON: Module does not comply with Type 6 spec
Thermal Trip	D26	ON: CPU is hot; system needs to be shut down
Suspend Status	D28	ON: Suspend Status
Mini-CD SW OK	D37	ON: USB and PCI-E have both switched to mini PCI-E slot

3.4 Connectors

3.4.1 Video

3.4.1.1 LVDS

Table 3-3 P8, Backlight Wafer Header Pin Definition

Pin	Signal
1	12V
2	BKLT_EN
3	GND
4	BKLT_CTRL
5	5V

Table 3-4 P6, LVDS Connector Pin Definition

Pin	Signal	Pin	Signal
1	LVDSA_DATA0_P	2	LVDSB_DATA0_P
3	LVDSA_DATA0_N	4	LVDSB_DATA0_N
7	LVDSA_DATA1_P	8	LVDSB_DATA1_P
9	LVDSA_DATA1_N	10	LVDSB_DATA1_N
13	LVDSA_DATA2_P	14	LVDSB_DATA2_P
15	LVDSA_DATA2_N	16	LVDSB_DATA2_N
19	LVDSA_DATA3_P	20	LVDSB_DATA3_P
21	LVDSA_DATA3_N	22	LVDSB_DATA3_N
25	LVDSA_CLK_P	26	LVDSB_CLK_P
27	LVDSA_CLK_N	28	LVDSB_CLK_N
31	LVDS_I2C_CLK	32	LVDS_I2C_DATA

Table 3-4 P6, LVDS Connector Pin Definition (continued)

Pin	Signal	Pin	Signal
33,35,37,39	VDD (3.3V OR 5V)	36,38,40	VDD (12V)
5, 11,17,23,29	GND	6,12,18,24,30,34	GND

The 3 V or 5 V DC LVDS power supply is configured through the 3-pin jumper P7.

Table 3-5 P7, LVDS Power Supply Jumper Configuration

Jumper Setting	Configuration
P7 (1-2)	3.3V (Default)
P7 (2-3)	5V

The 12 V DC LVDS power supply is configured through the 3-pin header P35

Table 3-6 P35, LVDS Power Supply Jumper Configuration

Jumper Setting	Configuration
P35 (1-2)	12V
P35 (2-3)	NC (Default)

3.4.1.2 VGA

Table 3-7 J5, VGA Connector Pin Definition

Pin	Signal	Pin	Signal
V1	CRT_R	V2	CRT_G
V3	CRT_B	V4	NC
V5	GND	V6	GND
V7	GND	V8	GND
V9	5V	V10	GND

Table 3-7 J5, VGA Connector Pin Definition (continued)

Pin	Signal	Pin	Signal
V11	NC	V12	DDCDATA
V13	HSYNC	V14	VSYNC
V15	DDCCLK		

3.4.1.3 HDMI

Table 3-8 J5, HDMI Connector Pin Definition

Pin	Signal	Pin	Signal
H1	OUT_D2+	H2	GND
H3	OUT_D2-	H4	OUT_D1+
H5	GND	H6	OUT_D1-
H7	OUT_D0+	H8	GND
H9	OUT_D0-	H10	TLC
H11	GND	H12	TLC-
H13	NC	H14	NC
H15	SCL_IN	H16	SDA_IN
H17	GND	H18	5V
H19	HPD_IN		

3.4.1.4 Display Port

Table 3-9 J3 and J4, Display Port Connector Pin Definition

Pin	Signal
1	DP_0_P
3	DP_0_N

Table 3-9 J3 and J4, Display Port Connector Pin Definition (continued)

Pin	Signal
4	DP_1_P
6	DP_1_N
7	DP_2_P
9	DP_2_N
10	DP_3_P
12	DP_3_N
13	DP_AUX_EN_N
15	DP_AUX_P
17	DP_AUX_N
18	DP_HPD
20	VCC_3
2,5,8,11,14,16,19	GND

3.4.2 Audio

Table 3-10 J16, Audio Jack Connector Pin Definition

Pin	Signal	Pin	Signal
A1	LIN_L	A2	LIN_JD
A3	AGND	A4	LIN_R
B1	LOUT_L	B2	LOUT_JD
B3	AGND	B4	LOUT_R
C0	AGND	C1	MIC1L
C2	MIC1_JD	C3	AGND
C4	MIC1R	MH1~MH4	AGND

Table 3-11 P11, Audio Header Pin Definition

Pin	Signal	Pin	Signal
1	MIC2_L	2	GND
3	MIC2_R	4	NC
5	LOUT2_R	6	MIC2_JD
7	GND	8	KEY
9	LOUT2_L	10	LOUT2_JD

3.4.3 LAN

Table 3-12 J1, LAN Connector Pin Definition

Pin	Signal	Pin	Signal
1	NC	14	1.8V
2	LAN1_MID3_N	15	LAN2_MID0_P
3	LAN1_MID2_P	16	LAN2_MID1_N
4	GBE0_CTREF	17	1.8V
5	LAN1_MID1_N	18	LAN2_MID2_P
6	LAN1_MID0_P	19	LAN2_MID3_N
7	GBE0_CTREF	20	GND
8	LAN1_MID3_P	21	LAN2_MID0_N
9	GBE0_CTREF	22	1.8V
10	LAN1_MID2_N	23	LAN2_MID1_P
11	LAN1_MID1_P	24	LAN2_MID2_N
12	GBE0_CTREF	25	1.8V
13	LAN1_MID0_N	26	LAN2_MID3_P
31	LAN1_LED_LINK_N	27	LAN2_LED_LINK_N
32	LAN1_LED_LINK_P	28	LAN2_LED_LINK_P
33	LAN1_LED_ACT_N	29	LAN2_LED_ACT_N

Table 3-12 J1, LAN Connector Pin Definition (continued)

Pin	Signal	Pin	Signal
34	LAN1_LED_ACT_P	30	LAN2_LED_ACT_P

3.4.4 PCI Express

Jumpers P9, P24, and P25 are used to configure PCI Express multiplexed devices.

Table 3-13 P9 Jumper Setting

Jumper Setting	Configuration
P9 (1-2)	x4 PCI-E slot
P9 (2-3)	x1 PCI-E slot (Default)

Table 3-14 P24 Jumper Setting

Jumper Setting	Configuration
P24 (1-2)	x4 PCI-E slot
P24 (2-3)	PCI-E Mini Card (Default)

Table 3-15 P25 Jumper Setting

Jumper Setting	Configuration
P25 (1-2)	x4 PCI-E slot
P25 (2-3)	LAN (Default)

3.4.5 USB

3.4.5.1 USB 2.0

Table 3-16 P2, USB 2.0 Header Pin Definition

Pin	Signal	Pin	Signal
1	5VDUAL	2	5VDUAL
3	USB1 _N	4	USB2_N
5	USB1_P	6	USB2_P
7	GND	8	GND
9	NC	10	Key

P1, a USB 2.0 header could be used for eUSB flash applications.

Table 3-17 P1, USB 2.0 Header Pin Definition

Pin	Signal	Pin	Signal
1	5VDUAL	2	5VDUAL
3	USB _N	4	NC
5	USB_P	6	NC
7	GND	8	GND
9	NC	10	Key

P39, another USB 2.0 header could be used for PCI Express Mini Card applications.

Table 3-18 P39, USB 2.0 Header Pin Definition

Pin	Signal	Pin	Signal
1	5VDUAL	2	NC
3	USB _N	4	NC

Table 3-18 P39, USB 2.0 Header Pin Definition (continued)

Pin	Signal	Pin	Signal
5	USB_P	6	NC
7	GND	8	GND
9	NC	10	Key

You need to set a 3-pin jumper (P10) if you want to configure USB multiplexed devices.

Table 3-19 P10, Jumper Settings for Configuring USB Multiplexed Devices

Jumper Setting	Configuration
P10 (1-2)	USB 2.0 onboard
P10 (2-3)	Mini Card (Default)

3.4.5.2 USB 3.0

Table 3-20 J14 and J15, USB 3.0 Connector Pin Definition

Pin	Signal	Pin	Signal
1	5V	2	USB_P0 _N
3	USB_P0 _P	4	GND
5	USB0_SSRX _N	6	USB0_SSRX _P
7	GND	8	USB0_SSTX _N
9	USB0_SSTX _P	10	5V
11	USB_P1 _N	12	USB_P1 _P
13	GND	14	USB1_SSRX_N
15	USB1_SSRX _P	16	GND
17	USB1_SSTX _N	18	USB1_SSTX _P

3.4.6 Storage

Table 3-21 P10–P13, SATA Socket Pin Definition

Pin	Signal
1	GND
2	SATA_TX_P
3	SATA_TX_N
4	GND
5	SATA_RX_N
6	SATA_RX_P
7	GND

3.4.7 Super I/O

3.4.7.1 Fan

Table 3-22 P3 and P27, Fan Header Pin Definition

Pin	Signal
1	GND
2	12V
3	TACH
4	PWM

3.4.7.2 PS/2

Table 3-23 P26, PS/2 (Keyboard and Mouse) Connectors Pin Definition

Pin	Signal
1	5V
2	KB_DATA
3	KB_CLK
4	MS_DATA
5	MS_CLK
6	GND

3.4.7.3 LPT Port

Table 3-24 P32, LPT Header Pin Definition

Pin	Signal	Pin	Signal
1	STB_N	2	PD0
3	PD1	4	PD2
5	PD3	6	PD4
7	PD5	8	PD6
9	PD7	10	ACK_N
11	BUSY_N	12	PE_N
13	SLCT_N	14	AFD_N
15	ERR_N	16	INIT_N
17	SLIN_N	18–25	GND
26	Key		

3.4.7.4 Serial Ports

Table 3-25 P18–P23, RS-232 Headers Pin Definition

Pin	Signal	Pin	Signal
1	DCD_N	2	RXD
3	TXD	4	DTR
5	GND	6	DSR_N
7	RTS_N	8	CTS_N
9	RI_N	10	Key

Table 3-26 P37 and P33, RS-422/RS-485 Headers Pin Definition

Pin	Signal
1	RS422_RX_N
2	RS422_RX_P
3	RS422_TX_N/RS485_N
4	RS422_TX_P/RS485_P

You need to set jumpers P34 and P41 to configure the serial ports defined above as RS-232 or RS-422/485 ports.

Table 3-27 Set Jumpers P34 and P41

Jumper Setting	Configuration
P34/P41 (1-2)	RS232 (Default)
P34/P41 (3-4)	RS422
P34/P41 (5-6)	RS485

Table 3-28 P40 PS_ON Select Jumper

Jumper Setting	Configuration
P40 (1-2)	Powe on through SIO (Default)
P40 (2-3)	S3 and Type VI

3.4.8 Power

Table 3-29 ATX Power Supply Connector Pin Definition

Pin	Signal
1	GND
2	GND
3	+12V
4	+12V

3.5 Headers

3.5.1 LPC

Table 3-30 P29, Low Pin Count (LPC) Header Pin Definition

Pin	Signal
1	CLK_33M
2	AD1
3	RST_N
4	AD0
5	FRAME_N
6	3.3V

Table 3-30 P29, Low Pin Count (LPC) Header Pin Definition (continued)

Pin	Signal
7	AD3
8	GND
9	AD2

3.5.2 Trusted Platform Module (TPM)

Table 3-31 P28, Trusted Platform Module (TPM) Header Pin Definition

Pin	Signal	Pin	Signal
1	CLK_33M	2	GND
3	FRAME_N	4	NC
5	RST_N	6	5V
7	AD3	8	AD2
9	3.3V	10	AD1
11	AD0	12	GND
13	SMB_CLK	14	SMB_DATA
15	3VDUAL	16	INT_SERIRQ
17	GND	18	CLKRUN_N
19	3.3V	20	DRQ0_N

3.5.3 GPIO

Table 3-32 P30, GPIO Header Pin Definition

Pin	Signal
1	GPO0

Table 3-32 P30, GPIO Header Pin Definition (continued)

Pin	Signal
2	GPI0
3	GPO1
4	GPI1
5	GPO2
6	GPI2
7	GPO3
8	GPI3
9	3.3V
10	GND

3.5.4 Miscellaneous I/O

Table 3-33 P16, Miscellaneous I/O Header Pin Definition

Pin	Signal	Pin	Signal
1	HD_LED	2	POWER_LED
3	HD_LED#	4	POWER_LED#
5	GND	6	EXT_PWRBTN_N
7	PM_SYSRST_N	8	GND
9	NC	10	Key

3.5.5 SPI Flash

Table 3-34 P13, SPI Flash Header Pin Definition

Pin	Signal
1	3.3V DUAL
2	GND
3	SPI_CS_N
4	SF_SPI_CLK
5	SF_SPI_SO
6	SF_SPI_SI
7	NC
8	NC

You must set the jumper defined below if you want to configure how the SPI flash is accessed.

Table 3-35 P12 and P14, Jumper Settings for SPI Flash SF100 header

P12 Jumper Setting	Configuration
P12 (1-2)	To PCH (Default)
P12 (2-3)	To SF100 header
P14 Jumper Setting	**Configuration**
P14 (1-2)	Enable SPI flash chip U9 and disable U10 (Default)
P14 (2-3)	Enable SPI flash chip U10 and disable U9

Use Jumper P15 to enable or disable the BIOS on the COM Express module

Table 3-36 P15 and P38, Jumper Configuration to Enable/Disable BIOS

P15 Jumper Setting	Configuration
P15 (1-2)	Enable BIOS on the module (Default)

Table 3-36 P15 and P38, Jumper Configuration to Enable/Disable BIOS (continued)

P15 Jumper Setting	Configuration
P15 (2-3)	Disable BIOS on the module
P38 Jumper Setting	**Configuration**
P38 (1-2)	Enable CS1 of BIOS on the module (Default)
P38 (2-3)	Disable CS1 of BIOS on the module

Table 3-37 P17 Case Open Select Header

P17 Setting	Configuration
P17 (1-2)	Disable the case open select header (Default)
P17 (2-3)	Enable the case open select header

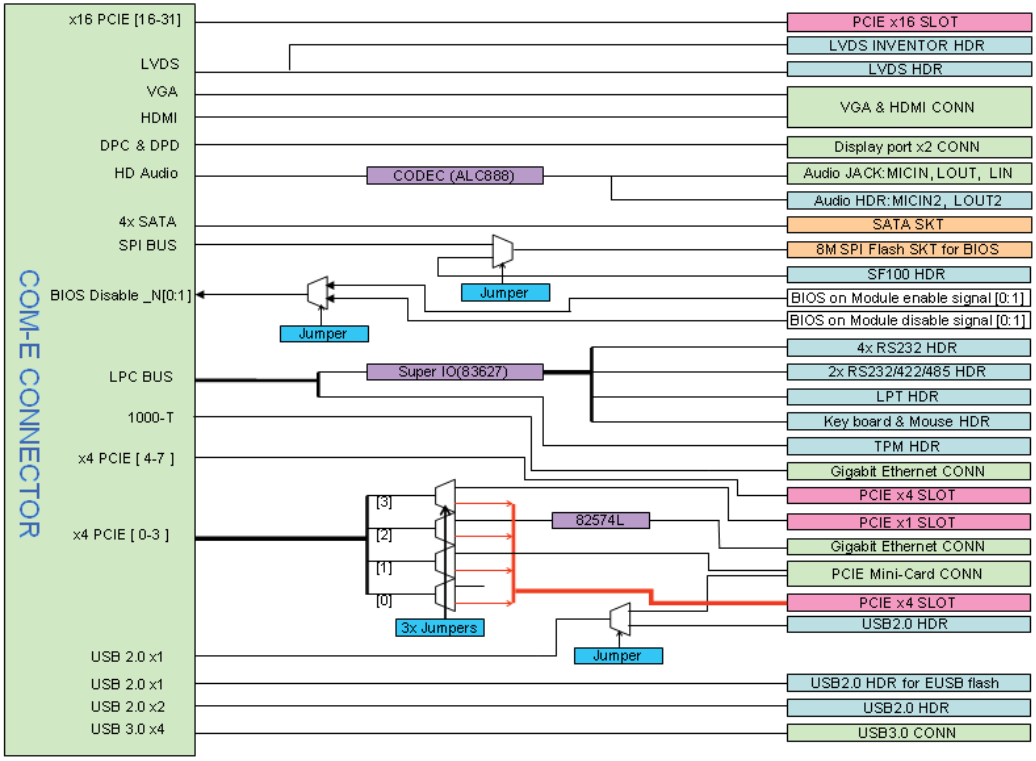
3.5.6 EEPROM

Table 3-38 P31, EEPROM Header Pin Definition

Pin	Signal
1	I2C_CLK
2	I2C_DATA
3	GND

4.1 Block Diagram

Figure 4-1 COM Express Type 6 Block Diagram



4.2 Video

The COMX-CAR-610 supports dual-independent displays using the Mobile Intel processor Integrated Graphics Controller. This carrier supports following graphic interfaces:

4.2.1 LVDS

The graphic controller supports up to 24-bit colors per pixel so the COMX-CAR-610 could support 24-bit LCD panels using different cables.

The board provides an LVDS and backlight header. The LVDS header is a 40 pin, dual-row header, while the backlight is a 5 pin wafer header.

For information on pin assignments, Table 3-4 on page 33

4.2.2 VGA

The carrier board supports VGA output from the COM Express connector. The VGA signals come from the same connector as the HDMI signals.

For information on pin assignments, Table 3-7 on page 34.

4.2.3 HDMI

The COMX-CAR-610 supports an HDMI interface from DDI1 of the COM Express connector.

For information on pin assignments, Table 3-8 on page 35.

4.2.4 Display Port

The COMX-CAR-610 supports two Display Ports from DDI2 and DDI3 of the COM Express connector.

For information on pin assignments, see Table 3-9 on page 35.

4.3 Audio

The COMX-CAR-610 supports line output, microphone output, and line input using industry standard 3.5 mm mini-jack connectors. The board also provides a two-channel HD audio as part of the integrated High-Definition Multimedia Interface (HDMI). The integrated HDMI requires a 1.5 V CODEC.

For information on pin assignments, see Table 3-10 on page 36 and Table 3-11 on page 37.

4.4 LAN

There are two Gigabit Ethernet ports: one is routed from the COM Express connector, and the other from WG82574L. The RJ-45 connectors are located on the board and both support 100/1000 Base T.

The LAN connectors have two integrated LEDs. When the green LED is OFF, it indicates that LAN link is not established. When it is ON, it indicates that a LAN link is established. When it "blinks," it indicates LAN link activity. A second green LED shall BLINK indicating the activity state of 100Mbps or 1000Mbps LAN.

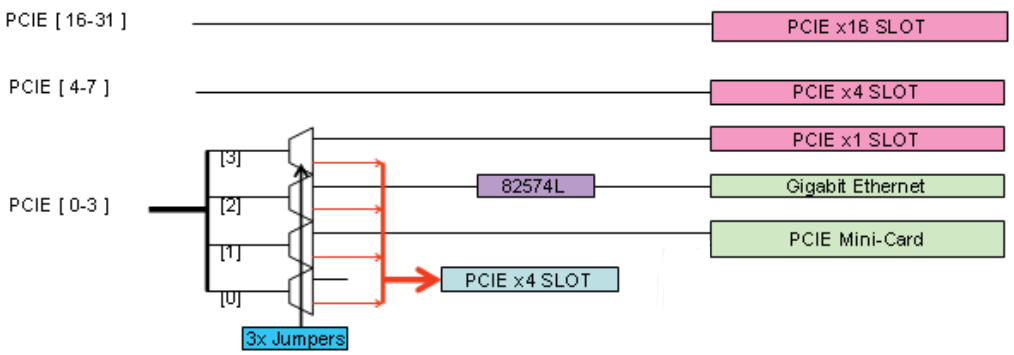
For information on pin assignments, see Table 3-12 on page 37.

4.5 PCI Express

The board has one x1 PCI-E slot and and one x16 PCI-E slot. The x16 PCI-E slot can be used for PCI Express Graphics (PEG). There are also two x4 PCI-E slots. One of the x4 slots can be used for other applications by using PCI-E multiplexer devices.

For information on pin assignments, see Table 3-13 on page 38.

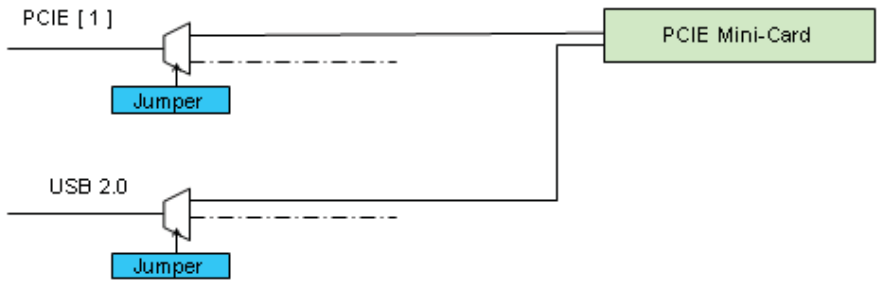
Figure 4-2 PCI Express Block Diagram



4.5.1 PCI Express Mini Card

The carrier board comes with a PCI Express Mini Card connector that supports the Intel WiMAX/WiFi Link 5050 and Intel WiFi Link 5000 series of wireless devices. The connector conforms to PCI Express Mini Card Electromechanical Specification 1.1, implementing both PCI Express and USB interfaces. The PCI-E Mini Card is available only when the related PCI-E MUX and USB MUX are both set appropriately.

Figure 4-3 PCI Express Mini Card Setting



4.6 USB

The are four USB 2.0 ports on the board. Two of them could be used for other applications: one for external USB flash, and the other for a PCI-E Mini Card through a USB MUX device. All USB 2.0 ports support low-speed, full-speed, and high-speed transfer rates using the USB 2.0 Enhanced Host Controller Interface (EHCI).

There are also four USB 3.0 ports from COM Express connector. The USB 3.0 ports support low-speed, full-speed, and high-speed transfer rates using the USB 3.0 Enhanced Host Controller Interface (EHCI).

For information on pin assignments, see Table 3-20 on page 40.

4.7 Storage

There are four SATA sockets on the carrier board for connecting to internal SATA 2.0 devices.

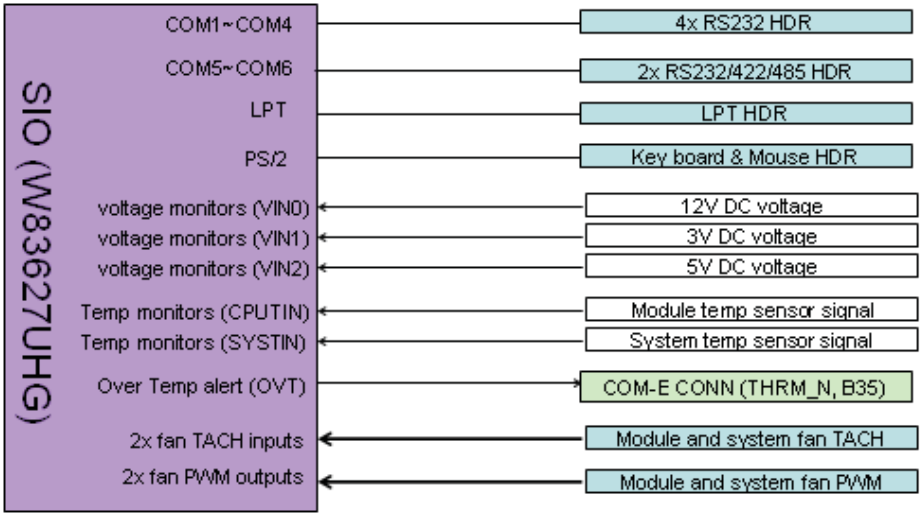
For information on pin assignments, see Table 3-21 on page 41.

4.8 Super I/O

The COMX-CAR-610 provides a Super I/O for extending several function modules.

For information on pin assignments, see *Super I/O* on page 41.

Figure 4-4 Super I/O Block Diagram



4.8.1 Voltage and Thermal Monitoring

The COMX-CAR-610 provides voltage monitoring capabilities on 3 V, 5 V, and 12 V rails, and also provides thermal monitoring capabilities for the COM Express module and its environment. Voltage and thermal values are read by the management engine, and alerts are reported to the management engine.

4.8.2 Fan Control

There are two 4-wire fan headers on the COMX-CAR-610 for module fan and system fan. Fans support fan TACH input and PWM fan speed control. The board uses a 4-pin locking connector equivalent to Molex 47053-1000.

For information on pin assignments, see Table 3-22 on page 41.

4.8.3 PS/2

There is a 6-pin wafer PS/2 header for keyboard and mouse.

For information on pin assignments, see Table 3-23 on page 42.

4.8.4 LPT

There is a 2 x 13 pin header for the LPT interface on the COMX-CAR-610.

For information on pin assignments, see Table 3-24 on page 42.

4.8.5 RS-232 and RS-422/485 Ports

The COMX-CAR-610 implements up to six RS-232 ports, two of which can be switched to RS-422 or RS-485 ports by setting two jumpers on the 2 x 3 pin header. All the RS-232 ports are implemented as 2 x 5 pin, dual-row headers, and the RS-422/485 ports as 1 x 4 pin, single-row headers.

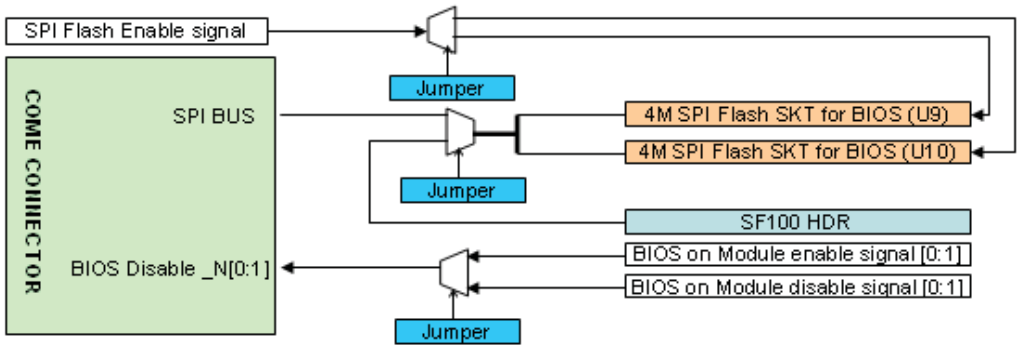
Two of the six COM ports from the Super I/O can be configured as RS-232 ports, or as RS-422 or RS-485 ports by setting a 6-pin, dual-row jumper.

For information on pin assignments, see Table 3-25 on page 43 and Table 3-26 on page 43.

4.9 SPI Flash

There are two SPI flash chips. Each chip has a capacity of 4 MB for BIOS, Gigabit Ethernet, and ME.

Figure 4-5 SPI Flash Block Diagram



The flash chips can be accessed either by the PCH or external devices with SPI interface through a 2 x 4 pin SF100 header.

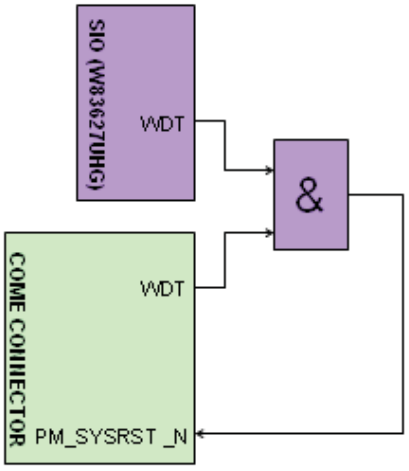
A 3-pin jumper (P12) is supplied to configure how SPI flash is accessed, and when the SPI flash is set to be accessed by external devices through the SF100 header. Each of the SPI flash chips can be enabled or disabled by setting a 3-pin jumper (P14). For information on pin assignments, see Table 3-35 on page 47.

The COMX-CAR-610 also provides two 3-pin jumpers (P15 and P38) to determine whether enable or disable the BIOS on the module. For information on pin assignments, see Table 3-36 on page 47.

4.10 Watchdog Timer

The COMX-CAR-610 provides a watchdog timer (WDT), which is a combination of two watchdog timers coming from COM Express connector and Super I/O.

Figure 4-6 Watchdog Timer Block Diagram



A valid WDT output signal resets the COMX-CAR-610. The BIOS disables the device at boot (software is enabled when the watchdog application loads). The WDT is disabled before entering S3 state, and re-enabled upon exiting S3.

4.11 Real Time Clock (RTC)

There is an onboard SMT battery holder. The battery holder allows for the quick and easy replacement of a 3 V button cell lithium battery which provides backup power to the onboard RTC.

The RTC supports two lockable memory ranges. By setting bits in the configuration space, two 8-byte ranges can be locked to read and write accesses. This prevents unauthorized reading of passwords or other system security information.

The RTC also supports a data alarm that allows for scheduling a wake up event up to 30 days in advance rather than just 24 hours in advance.

4.12 Wake Events

The COMX-CAR-610 awakes from sleep states S3 and S4 when one of the following conditions occur:

Table 4-1 Wake Events

Wake Events	Description
PCI Express	Through PE_WAKE_N
LAN	The management engine supports Wake-on-LAN (WOL) using wired LAN.
USB	-
Power button	If the power button is pressed for more than four seconds, it causes an unconditional transition to the S5 state.

Related Documentation

A.1 Emerson Network Power–Embedded Computing Documents

The publications listed below are referenced in this manual. You can obtain electronic copies of Emerson Network Power, Embedded Computing publications by contacting your local Emerson sales office. For released products, you can also visit our Web site for the latest copies of our product documentation.

1. Go to www.emersonnetworkpower.com/embeddedcomputing.
2. Under Resources, click Technical Documentation.
3. Enter the manual you are looking for in the search field. Use either the publication number or the complete name of the product to search for available manuals.

Table A-1 Emerson Network Power, Embedded Computing Publications

Document Title	Publication Number
COMX-CAR-610 COM Express Carrier Board Quick Start Guide	6806800A13
COMX-CAR-610 COM Express Carrier Board Release Notes	TBD
COMX-CAR-610 COM Express Carrier Board Safety Notes	6806800A12
COMX-CAR-610 Installation and Use	6806800K26
COMX-CAR-610 Quick Start Guide	6806800K27
COMX-CAR-610 Safety Notes	6806800K28

A.2 Manufacturers' Documents

You can also get additional information from manufacturers' documentation. Note that the information in these documents are subject to change without prior notice.

Safety Notes

This section provides warnings that precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed during all phases of operation, service, and repair of this equipment. You should also employ all other safety precautions necessary for the operation of the equipment in your operating environment. Failure to comply with these precautions or with specific warnings elsewhere in this manual could result in personal injury or damage to the equipment.

Emerson intends to provide all necessary information to install and handle the product in this manual. Because of the complexity of this product and its various uses, we do not guarantee that the given information is complete. If you need additional information, ask your Emerson representative.

The product has been designed to meet the standard industrial safety requirements. It must only be used in its specific area of office telecommunication industry, industrial control, and development. It must not be used in safety critical components, life supporting devices or on aircraft.

Only personnel trained by Emerson or persons qualified in electronics or electrical engineering are authorized to install, remove or maintain the product. The information given in this manual is meant to complete the knowledge of a specialist and must not be used as replacement for qualified personnel.

Keep away from live circuits inside the equipment. Operating personnel must not remove equipment covers. Only factory authorized service personnel or other qualified service personnel is allowed to remove equipment covers for internal subassembly or component replacement or any internal adjustment.

Do not install substitute parts or perform any unauthorized modification of the equipment or the warranty may be voided. Contact your local Emerson representative for service and repair to make sure that all safety features are maintained.

Emerson and our suppliers take significant steps to make sure that there are no bent pins on the backplane or connector damage to the boards prior to leaving the factory. Bent pins caused by improper installation or by inserting boards with damaged connectors could void the Emerson warranty for the backplane or boards.

This product operates with dangerous voltages that can cause injury or death. Use extreme caution when handling, testing, and adjusting this equipment and its components.

EMC

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules, EN55022. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, can cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user is required to correct the interference at his own expense.

Use only shielded cables when connecting peripherals to assure that appropriate radio frequency emissions compliance is maintained. Installed blades must have the face plates installed and all vacant slots in the shelf must be covered.

For applications where this product is provided without a face plate, or where the face plate has been removed, your system chassis/enclosure must provide the required electromagnetic interference (EMI) shielding to maintain EMC compliance.

Board products are tested in a representative system to show compliance with the above mentioned requirements. A proper installation in a compliant system maintains the required performance.

As soon as you modify the product or change the default configuration you are responsible for complying with all relevant regulatory standards.

VCCI

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Interference (VCCI). If this equipment is used in a domestic environment, radio disturbance can arise. When such trouble occurs, the user is required to take corrective actions.

Installation

Damage of Circuits
Electrostatic discharge and incorrect installation and removal of the product can damage circuits or shorten their life.
Before touching the product make sure that your are working in an ESD-safe environment or wear an ESD wrist strap or ESD shoes. Hold the product by its edges and do not touch any components or circuits.

Operation

Product Damage
High humidity and condensation on surfaces cause short circuits.
Do not operate the product outside the specified environmental limits. Make sure the product is completely dry and there is no moisture on any surface before applying power.

Battery

Data Loss
Installing another battery type than the one that is mounted at product delivery may cause data loss since other battery types may be specified for other environments or may have a shorter lifetime.
Only use the same type of lithium battery as is already installed.

PCB and Battery Holder Damage
Removing the battery with a screw driver may damage the PCB or the battery holder.
Do not use a screw driver to remove the battery from its holder.

Product Damage
Incorrect replacement of lithium batteries can result in a hazardous explosion.
When exchanging the on-board lithium battery, make sure that the new and the old battery are exactly the same battery models.
If the respective battery model is not available, contact your local Emerson sales representative for the availability of alternative officially approved battery models.

Environment

Environmental Damage
Improperly disposing of used products may harm the environment.
Always dispose of used products according to your country's legislation and manufacturer's instructions.

Sicherheitshinweise

Dieses Kapitel enthält Hinweise, die potentiell gefährlichen Prozeduren innerhalb dieses Handbuchs vorrangestellt sind. Beachten Sie unbedingt in allen Phasen des Betriebs, der Wartung und der Reparatur des Systems die Anweisungen, die diesen Hinweisen enthalten sind. Sie sollten außerdem alle anderen Vorsichtsmaßnahmen treffen, die für den Betrieb des Systems innerhalb Ihrer Betriebsumgebung notwendig sind. Wenn Sie diese Vorsichtsmaßnahmen oder Sicherheitshinweise, die an anderer Stelle diese Handbuchs enthalten sind, nicht beachten, kann das Verletzungen oder Schäden am System zur Folge haben.

Emerson ist darauf bedacht, alle notwendigen Informationen zum Einbau und zum Umgang mit dem System in diesem Handbuch bereit zu stellen. Da es sich jedoch bei dem System um ein komplexes Produkt mit vielfältigen Einsatzmöglichkeiten handelt, können wir die Vollständigkeit der im Handbuch enthaltenen Informationen nicht garantieren. Falls Sie weitere Informationen benötigen sollten, wenden Sie sich bitte an die für Sie zuständige Geschäftsstelle von Emerson.

Das Produkt erfüllt die für die Industrie geforderten Sicherheitsvorschriften und darf ausschließlich für Anwendungen in der Telekommunikationsindustrie, im Zusammenhang mit Industriesteuerungen und in der Entwicklung verwendet werden. Es darf nicht in sicherheitskritischen Anwendungen, lebenserhaltenden Geräten oder in Flugzeugen verwendet werden.

Einbau, Wartung und Betrieb dürfen nur von durch Emerson ausgebildetem oder im Bereich Elektronik oder Elektrotechnik qualifiziertem Personal durchgeführt werden. Die in diesem Handbuch enthaltenen Informationen dienen ausschließlich dazu, das Wissen von Fachpersonal zu ergänzen, können dieses jedoch nicht ersetzen.

Halten Sie sich von stromführenden Leitungen innerhalb des Systems fern. Entfernen Sie auf keinen Fall die Systemabdeckung. Nur werksseitig zugelassenes Wartungspersonal oder anderweitig qualifiziertes Wartungspersonal darf die Systemabdeckung entfernen, um Systemkomponenten zu ersetzen oder andere Anpassungen vorzunehmen.

Installieren Sie keine Ersatzteile oder führen Sie keine unerlaubten Veränderungen am System durch, sonst verfällt die Garantie. Wenden Sie sich für Wartung oder Reparatur bitte an die für Sie zuständige Geschäftsstelle von Emerson. So stellen Sie sicher, dass alle sicherheitsrelevanten Aspekte beachtet werden.

Emerson und unsere Zulieferer unternehmen größte Anstrengungen um sicherzustellen, dass sich Pins und Stecker von Boards vor dem Verlassen der Produktionsstätte in einwandfreiem Zustand befinden. Verbogene Pins, verursacht durch fehlerhafte Installation oder durch Installation von Boards mit beschädigten Steckern kann die durch Emerson gewährte Garantie für Boards und Backplanes erlöschen lassen.

Dieses Produkt wird mit gefährlichen Spannungen betrieben, die zu Verletzungen und Tod führen können. Seien Sie im Umgang mit dem Produkt und beim Testen und Anpassen des Produktes und seiner Komponenten äußerst vorsichtig.

EMV

FCC Class A
Das Produkt wurde getestet und erfüllt die für digitale Geräte der Klasse A gültigen Grenzwerte gemäß den FCC-Richtlinien Abschnitt 15 bzw. EN 55022 Klasse A. Diese Grenzwerte sollen einen angemessenen Schutz vor Störstrahlung beim Betrieb des Produkts in Geschäfts-, Gewerbe- sowie Industriebereichen gewährleisten. Das Produkt arbeitet im Hochfrequenzbereich und erzeugt Störstrahlung. Bei unsachgemäßem Einbau und anderem als in diesem Handbuch beschriebenen Betrieb können Störungen im Hochfrequenzbereich auftreten.
Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.
Benutzen Sie zum Anschließen von Peripheriegeräten ausschließlich abgeschirmte Kabel. So stellen Sie sicher, dass ausreichend Schutz vor Störstrahlung vorhanden ist. Die Blades müssen mit der Frontblende installiert und alle freien Steckplätze müssen mit Blindblenden abgedeckt sein.
Änderungen, die nicht ausdrücklich von Emerson erlaubt sind, können Ihr Recht das System zu betreiben zunichte machen.

Wenn dieses Produkt ohne Frontblende ausgeliefert wird oder wenn die Frontblende entfernt wird, muss Ihr System die notwendigenSchutzmechnismen gegen elektromagnetische interferenzen bereitstellen, um die Einhaltung der eletromagnetischen Verträglichkeit des Systems zu gewährleisten.

Boardprodukte werden in einem repräsentativen System getestet, um zu zeigen, dass das Board den oben aufgeführten EMV-Richtlinien entspricht. Eine ordnungsgemäße Installation in einem System, welches die EMV-Richtlinien erfüllt, stellt sicher, dass das Produkt gemäß den EMV-Richtlinien betrieben wird.

Sobald Sie das Produkt oder seine Standardkonfiguration verändern, müssen Sie dafür sorgen, dass alle relevanten Richtlinien eingehalten werden.

VCCI

Das Produkt ist eine Einrichtung der Klasse A gemäß dem Standard des Voluntary Control Council for Interference von Information Technology Interference (VCCI). Wird das Produkt in Wohngegenden betrieben, können Störungen im Hochfrequenzbereich auftreten. In einem solchen Fall ist der Benutzer verpflichtet, entsprechende Gegenmaßnahmen zu ergreifen.

System Installation

Beschädigung von Schaltkreisen
Elektrostatische Entladung und unsachgemäßer Ein- und Ausbau des Produktes kann Schaltkreise beschädigen oder ihre Lebensdauer verkürzen.
Bevor Sie das Produkt oder elektronische Komponenten berühren, vergewissern Sie sich, daß Sie in einem ESD-geschützten Bereich arbeiten.

Betrieb

Beschädigung des Systems
Hohe Luftfeuchtigkeit und Kondensat auf den Oberflächen der Produkte kann zu Kurzschlüssen führen.
Betreiben Sie die Produkte nur innerhalb der angegebenen Grenzwerte für die relative Luftfeuchtigkeit und Temperatur und stellen Sie vor dem Einschalten des Stroms sicher, dass sich auf den Produkten kein Kondensat befindet.

Batterie

Datenverlust
Wenn Sie einen anderen Batterietyp installieren als der, der bei Auslieferung des Produktes installiert war, kann Datenverlust die Folge sein, da die neu installierte Batterie für andere Umgebungsbedingungen oder eine andere Lebenszeit ausgelegt sein könnte.
Verwenden Sie daher den gleichen Batterietyp, der bei Auslieferung des Produktes installiert war.

Beschädigung des PCBs und der Batteriehalterung
Wenn Sie die Batterie mit einem Schraubendreher ausbauen, können das PCB und die Batteriehalterung beschädigt werden.
Benutzen Sie keinesfalls einen Schraubendreher, um die Batterie aus der Halterung zu nehmen.

Beschädigung des Produktes
Fehlerhafter Austausch von Lithium-Batterien kann zu gefährlichen Explosionen führen.
Wenn SIe die Lithium-Batterie auf dem Produkt austauschen, stellen Sie sicher, dass die alte und die neue Batterie vom gleichen Typ sind.
Ist der Batterietyp nicht verfügbar, wenden Sie sich an Emerson um herauszufinden, welcher Batterietyp offiziell alternativ verwendet werden darf.

Umweltschutz

Umweltverschmutzung
Falsche Entsorgung der Produkte schadet der Umwelt.
Entsorgen Sie alte Produkte gemäß der in Ihrem Land gültigen Gesetzgebung und den Empfehlungen des Herstellers.

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